In the Claims:

Listed below is a clean copy of amended claims and new claims. A marked-up copy of the amended claims is provided in an accompanying document.

2193. (amended) A method of treating a hydrocarbon containing formation in situ, comprising:

providing heat from one or more heaters disposed in the formation to at least a portion of the formation such that an average heating rate of a part of the formation is less than about 1 °C per day in a pyrolysis temperature range; and

allowing the heat to transfer from the one or more heaters to the part of the formation such that a permeability of at least a portion of the part of the formation increases to greater than about 100 millidarcy.

2194. (amended) The method of claim 2193, wherein the one or more heaters comprise at least two heaters, and wherein controlled superposition of heat from at least the two heaters pyrolyzes at least some hydrocarbons in the part of the formation.

2195. (amended) The method of claim 2193, further comprising maintaining a temperature in the part of the formation in a pyrolysis temperature range of about 270 °C to about 400 °C.

2200. (amended) The method of claim 2193, further comprising controlling a pressure and a temperature in at least a majority of the part of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

2202. (amended) The method of claim 2193, wherein providing heat from one or more of the heaters to at least the portion of the formation comprises:

heating a selected volume (V) of the hydrocarbon containing formation from one or more of the heaters, wherein the formation has an average heat capacity (C_v), and wherein the heating pyrolyzes at least some hydrocarbons in the selected volume of the formation; and

wherein heating energy/day (*Pwr*) provided to the selected volume is equal to or less than $h*V*C_v*\rho_B$, wherein ρ_B is formation bulk density, and wherein an average heating rate (h) of the selected volume is about 10 °C/day.

2219. (amended) The method of claim 2193, further comprising controlling a pressure in at least a majority of the part of the formation, wherein the controlled pressure is at least about 2.0 bar absolute.

2220. (amended) The method of claim 2193, further comprising controlling formation conditions to produce a mixture from the formation, wherein a partial pressure of H_2 in the mixture is greater than about 0.5 bar.

2221. (amended) The method of claim 2220, wherein the partial pressure of H_2 in the mixture is measured when the mixture is at a production well.

2222. (amended) The method of claim 2193, further comprising altering a pressure in the formation to inhibit production of hydrocarbons from the formation having carbon numbers greater than about 25.

2224. (amended) The method of claim 2193, further comprising:

providing hydrogen (H_2) to the heated part of the formation to hydrogenate hydrocarbons in the part of the formation; and

heating a portion of the part of the formation with heat from hydrogenation.

2232. (amended) A method of treating a hydrocarbon containing formation in situ, comprising:

providing heat from one or more heaters disposed in the formation to at least a portion of the formation such that an average heating rate of a part of the formation is less than about 1 °C per day in a pyrolysis temperature range; and

allowing the heat to transfer from the one or more heaters to the part of the formation to increase a permeability of a majority of the part of the formation such that the permeability of the majority of the part is substantially uniform.

2233. (amended) The method of claim 2232, wherein the one or more heaters comprise at least two heaters, and wherein controlled superposition of heat from at least the two heaters pyrolyzes at least some hydrocarbons in the part of the formation.

2234. (amended) The method of claim 2232, further comprising maintaining a temperature in the part of the formation in a pyrolysis temperature range of about 270 °C to about 400 °C.

2239. (amended) The method of claim 2232, further comprising controlling a pressure and a temperature in at least a majority of the part of the formation, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

2241. (amended) The method of claim 2232, wherein providing heat from one or more of the heaters to at least the portion of the formation comprises:

heating a selected volume (V) of the hydrocarbon containing formation from one or more of the heaters, wherein the formation has an average heat capacity (C_v), and wherein the heating pyrolyzes at least some hydrocarbons in the selected volume of the formation; and

wherein heating energy/day (Pwr) provided to the selected volume is equal to or less than $h*V*C_v*\rho_B$, wherein ρ_B is formation bulk density, and wherein an average heating rate (h) of the selected volume is about 10 °C/day.

2258. (amended) The method of claim 2232, further comprising controlling a pressure in at least a majority of the part of the formation, wherein the controlled pressure is at least about 2.0 bar absolute.

2259. (amended) The method of claim 2232, further comprising controlling formation conditions to produce a mixture from the formation, wherein a partial pressure of H_2 in the mixture is greater than about 0.5 bar.

2260. (amended) The method of claim 2232, further comprising producing a mixture from the formation, wherein a partial pressure of H_2 in the mixture is measured when the mixture is at a production well.

2261. (amended) The method of claim 2232, further comprising altering a pressure in the formation to inhibit production of hydrocarbons from the formation having carbon numbers greater than about 25.

2263. (amended) The method of claim 2232, further comprising:

providing hydrogen (H_2) to the heated part to hydrogenate hydrocarbons in the part; and

heating a portion of the part with heat from hydrogenation.

5409. (amended) The method of claim 5404, further comprising controlling a pressure and a temperature in at least a majority of the pyrolysis zone, wherein the pressure is controlled as a function of temperature, or the temperature is controlled as a function of pressure.

5410. (amended) The method of claim 5404, wherein providing heat from the heaters to the portion of the formation comprises:

heating a selected volume (V) of the formation from one or more of the heaters, wherein the formation has an average heat capacity (C_v), and wherein the heating pyrolyzes at least some hydrocarbons in the selected volume of the formation; and

wherein heating energy/day (Pwr) provided to the selected volume is equal to or less than $h*V*C_v*\rho_B$, wherein ρ_B is formation bulk density, and wherein an average heating rate (h) of the selected volume is about 10 °C/day.